# Cichlidogyrus parasitic infection and its potential role in the diversification of its cichlid fish host

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# *Cichlidogyrus* parasitic infection and its potential role in the diversification of its cichlid fish host

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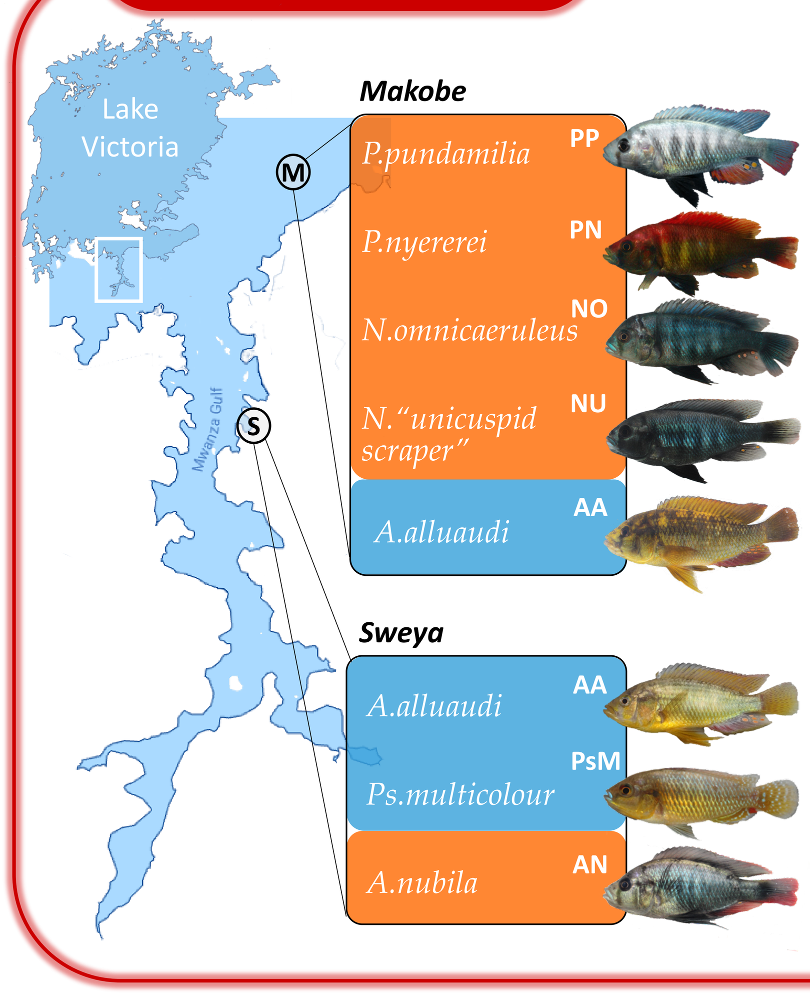
## INTRODUCTION

Parasites may promote the evolutionary diversification of their hosts, by engaging in arms races with host populations. Lake Victoria cichlids and their parasites are a good system to study this process. One lineage of cichlids has rapidly made a large species radiation while others have not speciated at all. Cichlids of both groups are infected by *Cichlidogyrus* spp., a cichlid-specific monogenean gill parasite that has undergone its own radiations. We compare cichlids of radiating and non-radiating lineages to test predictions of diversification and co-diversification.

**If *Cichlidogyrus* is involved in host diversification, then we expect**

- **reduced infection abundance and lower parasite diversity in species of the radiating lineage**, resulting from specific resistance evolution.
- **different infection profiles amongst species of the radiation**.

## METHODS




*Cichlidogyrus* flatworms were isolated from gills of wildcaught fish and their morphology was assessed under a microscope.

Conducted for two fish communities (Makobe, Sweya), each composed of sympatric host species, that are part of the radiation or not part of it.

## RESULTS

At Makobe, *Cichlidogyrus* load is higher in the non-radiating than in the sympatric radiating species; but not at Sweya, where the overall worm abundance is lower.

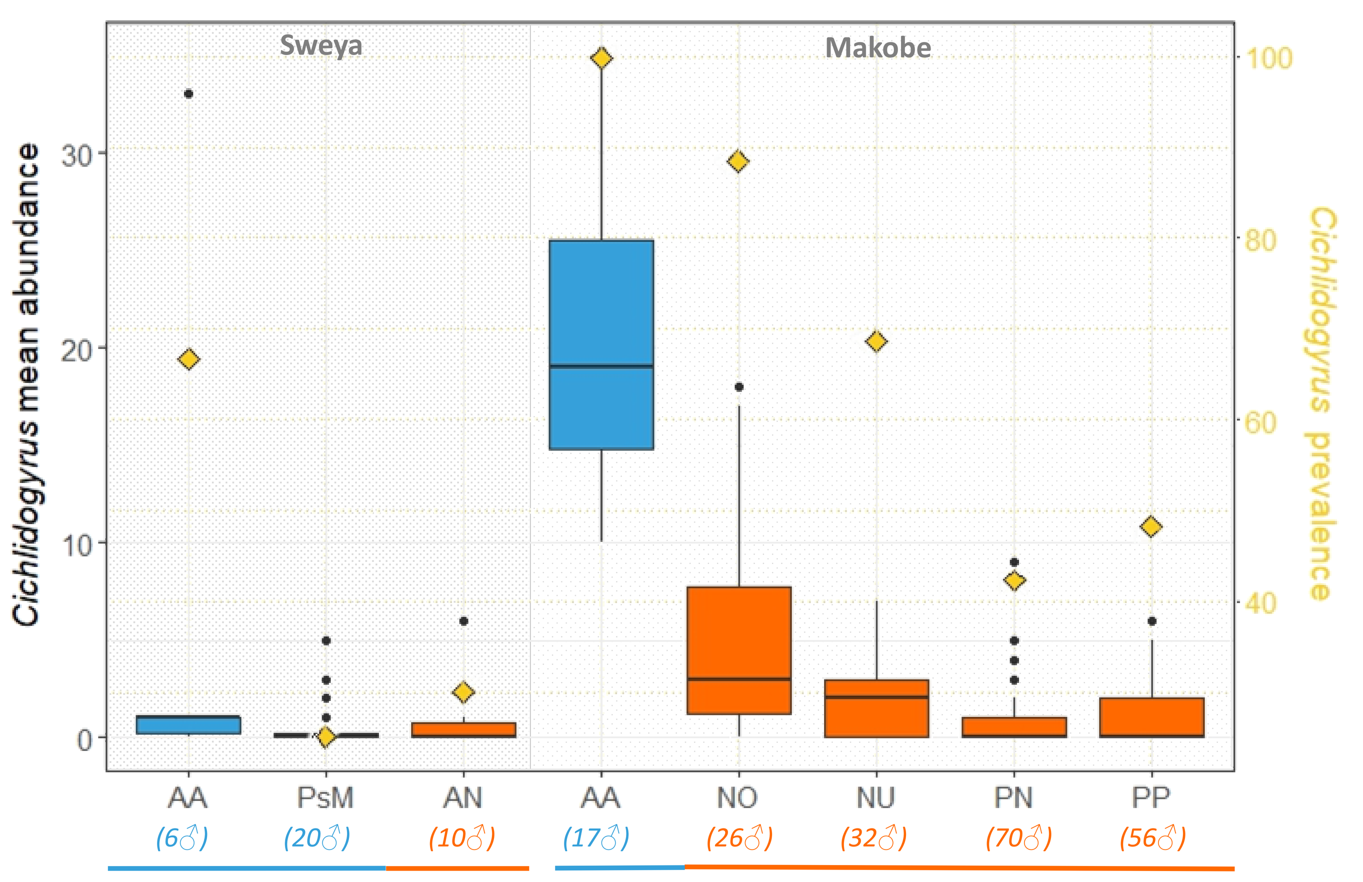



**Fig. 1**: *Cichlidogyrus* mean abundance (nr of worms) and prevalence at Sweya and Makobe. Nr of host individuals in brackets.


*Cichlidogyrus* community differs between the two lineages, between the two non-radiating species, but not among radiation members. Worm diversity of the latter is not lower than the non-radiating species. Worm community is associated with host species rather than sampling location.

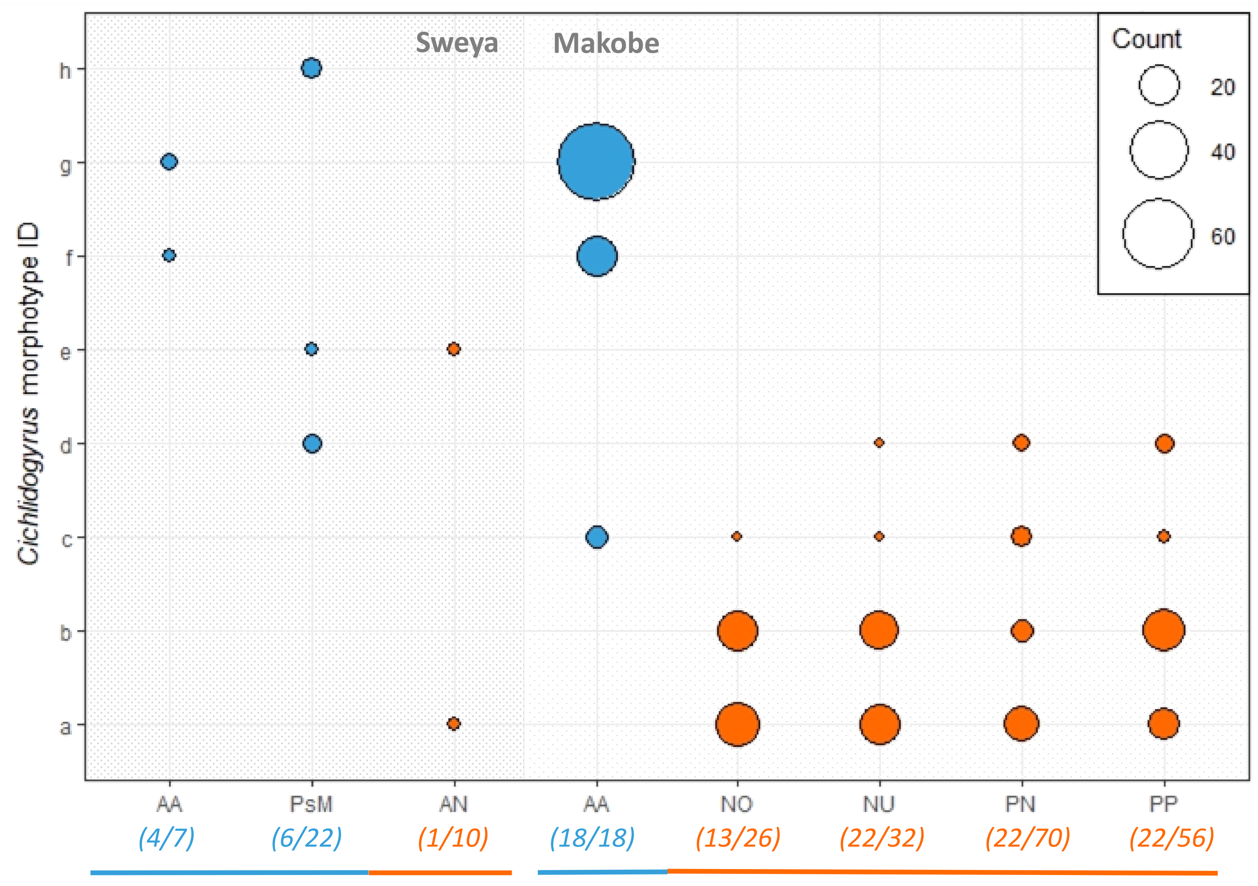



**Fig.2**: *Cichlidogyrus* morphotype distribution at Sweya and Makobe. Nr of individuals infected/total in brackets.

To assess differences among radiation members, we added 7 host species at Makobe. *Cichlidogyrus* load is significantly higher in algivores than in other trophic groups (excepted one insectivore).

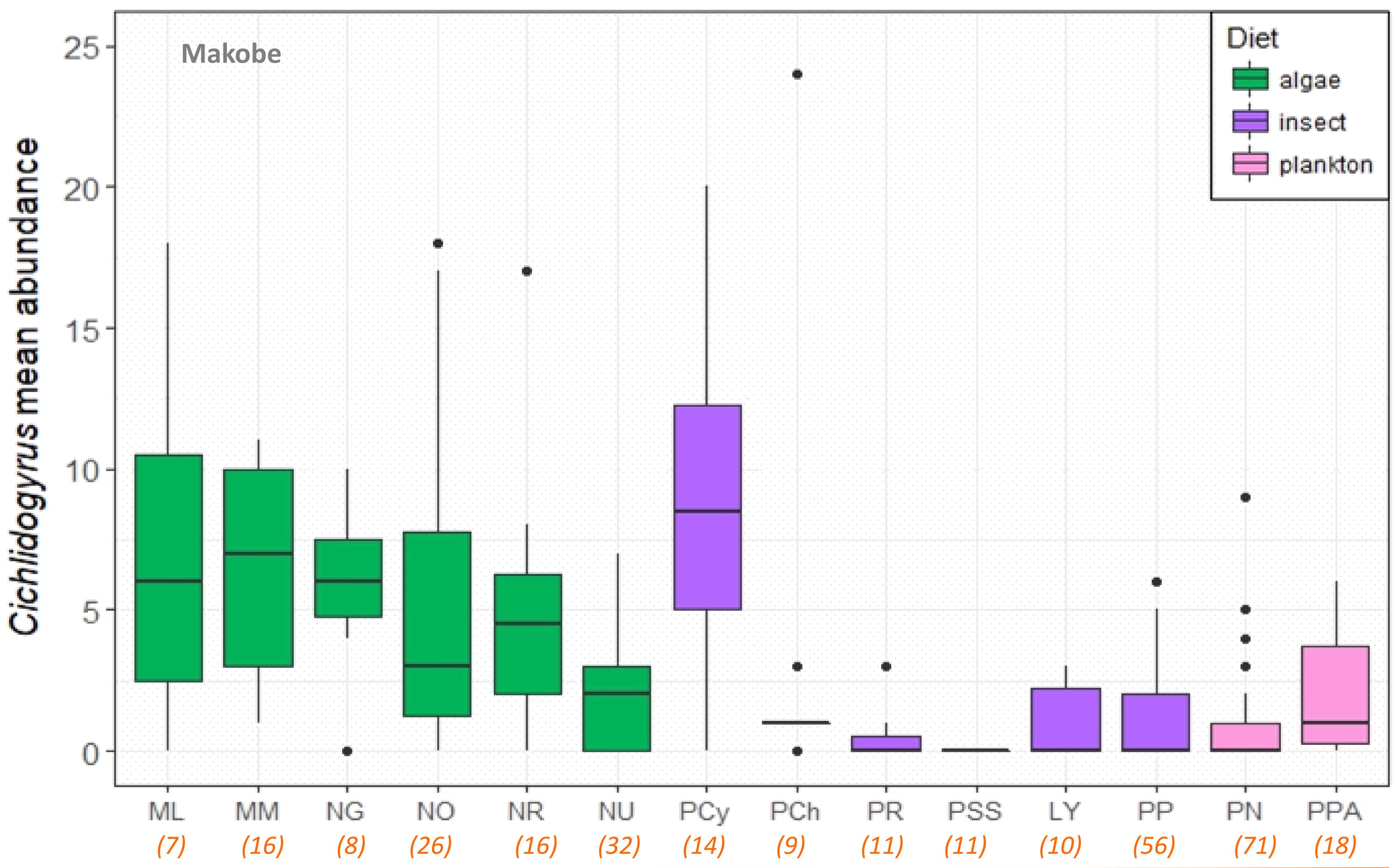



**Fig. 3**: : *Cichlidogyrus* mean abundance (nr of worms) at Makobe in radiation members. Nr of host individuals in brackets.

## CONCLUSIONS

*Cichlidogyrus* load is lower (**fig.1**) in the cichlids of the radiation than in a sympatric non-radiating cichlid, but not at the Sweya site where the overall worm infection is lower. Radiating and non-radiating lineages are infected by a different subset of parasite species (**fig.2**), suggesting they may be resistant to some of the species that infect the other lineage.

*A.alluaudi* is infected by the same morphotypes at two distant locations, suggesting parasite species-specificity. Infected radiating hosts do not differ in their parasite species composition, inconsistent with a co-diversification scenario.

*Cichlidogyrus* abundance varies between host trophic groups (**fig.3**), suggesting that variations in worm abundance may be explained by differences in exposure.

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